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CLAIMS:

- 1) A computer readable storage medium containing a program
element for execution by a computing device to implement
5 a software installation manager in a data network
including a set of nodes, the set of nodes having a
topology characterized in that a message directed from a
first node of the set to a third node of the set passes
through a second node of the set, said software
10 installation manager including:
a) a control entity;
b) an I/O for the exchange of messages between said
control entity and the plurality of nodes;
c) said control entity operative to perform a software
15 product installation process, said software product
installation process including generation of messages
directed to the nodes of the set for causing
installation of at least one software product on the
nodes of the set in parallel according to a non-
20 blocking sequence; and
d) the non-blocking sequence being characterized in that
installation of the at least one software product on
one node of the set does not block installation of
the software product on another node of the set.
25
- 2) A computer readable storage medium as defined in claim
1, wherein said control entity includes a node
sequencing entity for dynamically determining the non-
blocking sequence.
30
- 3) A computer readable storage medium as defined in claim
2, wherein said node sequencing entity is responsive at
least in part to data indicative of a number of

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communication hops between a point of reference and each node of the set to derive the non-blocking sequence.

- 4) A computer readable storage medium as defined in claim
5 3, wherein said node sequencing entity is operative to
issue a query message to each node of the set to prompt
the node to generate a response message indicative of
the number of communication hops between the point of
reference and the node.
- 10
- 5) A computer readable storage medium as defined in claim
4, wherein the data indicative of the number of
communication hops between the point of reference and
each node of the set is derived from response messages
15 received by node sequencing entity from each node of the
set.
- 6) A computer readable storage medium as defined in claim
5, wherein the point of reference is a location of a
20 file server in the data network holding at least one
software load downloaded by the nodes of the set to
perform the installation of the at least one software
product.
- 25 7) A computer readable storage medium as defined in claim
2, wherein said control entity includes a message
generation entity in communication with said node
sequencing entity, said message generation entity being
responsive to data produced by said node sequencing
30 entity and being indicative of the non-blocking sequence
to issue at least some messages to nodes of the set
according to an order determined by the non-blocking
sequence.

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- 8) A computer readable storage medium as defined in claim 2, wherein the messages convey commands for execution by the nodes of the set.
- 5 9) A computer readable storage medium as defined in claim 8, wherein the messages convey a first command for instructing each node in the set to fetch a catalogue of files from a file server in the data network.
- 10 10) A computer readable storage medium as defined in claim 9, wherein the messages convey a second command for instructing each node in the set to fetch files from the catalogue of files from the file server in the data network.
- 15 11) A computer readable storage medium as defined in claim 10, wherein the messages convey a third command for instructing each node to activate the at least one software product.
- 20 12) A computer readable storage medium as defined in claim 11, wherein the messages convey a fourth command for instructing each node to commit to the at least one software product.
- 25 13) A computer readable storage medium as defined in claim 11, wherein said control entity is operative to issue messages conveying the third command according to the non-blocking sequence determined by the node sequencing entity.
- 30 14) A computer readable storage medium as defined in claim 13, wherein the third command causes each node of the set of nodes to reboot.

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- 15) A computer readable storage medium as defined in claim 14, wherein said control entity awaits a confirmation of a node in the set of nodes acknowledging reception of the third command before sending the third command to a next node in the set of nodes according to the non-blocking sequence.
- 16) A computer readable storage medium as defined in claim 13, wherein said control entity is operative to track progress of the installation of the at least one software product on each node of the set.
- 17) A computer readable storage medium as defined in claim 16, wherein said control entity is operative to generate a log indicative of the nodes of the set on which the installation of the at least one software product has failed.
- 18) A computer readable storage medium as defined in claim 17, wherein the log indicates for each node of the set on which the installation has failed, the reason for the failure.
- 19) A computer readable storage medium as defined in claim 1, wherein said control entity is responsive to messages issued by a network manager entity to initiate said software product installation process.
- 20) A computer readable storage medium as defined in claim 19, wherein said control entity is operative to generate a log indicative of the nodes of the set on which the installation of the at least one software product has failed and to generate messages directed to

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the network manager conveying the log to the network manager.

- 21) A computer readable storage medium containing a
5 program element for execution by a computing device to
implement a software installation manager in a data
network including a set of nodes, the set of nodes
having a topology characterized in that a message
directed from a first node of the set to a third node of
10 the set passes through a second node of the set, said
software installation manager including:
- a) control means;
 - b) an I/O means for the exchange of messages between
said control means and the plurality of nodes;
 - 15 c) said control means operative to perform a software
product installation process, said software product
installation process including generation of message
means directed to the nodes of the set for causing
installation of at least one software product on the
20 nodes of the set in parallel according to a non-
blocking sequence; and
 - d) the non-blocking sequence being characterized in that
installation of the at least one software product on
one node of the set does not block installation of
25 the software product on another node of the set.
- 22) A subnetwork management node in a data network, the
data network including a set of nodes other than the
subnetwork management node, the set of nodes having a
30 topology characterized in that a message directed from a
first node of the set to a third node of the set passes
through a second node of the set, said subnetwork
management node comprising:
- a) a control entity;

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- b) an I/O for the exchange of messages between said control entity and the set of nodes;
- c) said control entity operative to perform a software product installation process, said software product installation process including generation of messages directed to the nodes of the set for causing installation of at least one software product on the nodes of the set in parallel according to a non-blocking sequence; and
- 10 d) the non-blocking sequence being characterized in that installation of the at least one software product on one node of the set does not block installation of the software product on another node of the set.
- 15 23) A method to perform software installation in a data network, said method comprising:
- a) sending messages to each node in a set of nodes, the set of nodes having a topology characterized in that a message directed from a first node of the set to a third node of the set passes through a second node of the set;
- 20 b) the messages directing installation of at least one software product on each node of the set;
- c) the messages being sent to the nodes of the set in a manner to cause the installation of the at least one software product in parallel according to a non-blocking sequence; and
- 25 d) the non-blocking sequence being characterized in that installation of the at least one software product on one node of the set does not block installation of the software product on another node of the set.
- 30 24) A computer readable storage medium containing a program element for execution by a computing device to

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implement a software installation manager in a data network including a set of nodes, the set of nodes having a topology characterized in that a message directed from a first node of the set to a third node of the set passes through a second node of the set, said software installation manager including:

- a) a control entity;
- b) an I/O for the exchange of messages between said control entity and the plurality of nodes;
- 10 c) said control entity operative to perform a software product installation process, said software product installation process including generation of messages directed to the nodes of the set for causing installation of at least one software product on the nodes in several stages;
- 15 d) one of said stages including rebooting of the nodes of the set; and
- e) said software product installation process including generation of messages directed at the nodes of the set according to a non-blocking sequence commanding at least a plurality of the nodes of the set to perform coincident rebooting.
- 20

- 25 25) A computer readable storage medium as defined in claim 24, wherein said software product installation process including generation of messages directed at the nodes of the set according to a non-blocking sequence commanding all nodes of the set to perform coincident rebooting.

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26) A computer readable storage medium as defined in claim 25, wherein said control entity includes a node sequencing entity for dynamically determining the non-blocking sequence.

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26) A computer readable storage medium as defined in
claim 25, wherein said control entity includes a node
sequencing entity for dynamically determining the non-
blocking sequence.
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